

- 1 **Fig. 1 is a section across a valley in Northern England, showing the location of 6 weather stations, labelled A to F.**
Fig. 2 shows the number of days of fog during the month of November between 1995 and 2003 recorded at the weather stations shown in Fig. 1.
Fig. 3 shows average daily maximum and minimum temperatures at the weather stations during November for the same time period.

- (a) **Using Fig. 2, state the range of days of fog at point A.**

- $7 - 2 = 5$

[2]

- (b) **'Fog is more common on valley floors than on the sides of valleys'**
To what extent does Fig. 2 support this assertion?

To a large extent, especially if using the average figures for stations B, C and D
However, station E should be noted, where both the max and average are above the min for stations C and D.

Up to 3 marks for an evaluative statement with some support

Up to 2 marks for evidence contrary to the points above

Only 1 mark max if no data support

[4]

- (c) **Using Fig. 3 compare the trend of average daily maximum temperatures at the weather stations with the trend of average daily minimum temperatures**

Look for comparative statements for credit; little credit for description without comparison. Data needs to be well used to support points.

L3 (5-6 marks)

A clear focus on the comparative part of the question; good quality data support used with precision

L2 (3-4 marks)

Some relevant comparisons

Data support lacking, or present but lacks precision

L1 (0-2 marks)

Weak description of separate trends

Little/no attempt to compare

[6]

(d) Evaluate the usefulness of Figs 1, 2 and 3 to those who study the microclimates of valleys.

The study of microclimates in valleys covers a range of weather phenomena, including wind speed and direction neither of which are shown.

Fig. 1 shows relief, altitude and aspect, all of which are important factors in the formation of microclimates. The vertical scale, much larger in comparison to the horizontal scale, exaggerates the slope angle.

Figs 2 and 3 provide good visual impressions of fog and temperature. Fig. 2 in particular helps to identify a frost hollow.

Fig. 3 deals with averages – which often conceal more than they reveal.

A major factor is the overall synoptic situation – none of the resources show this. Other dimensions that could be usefully explored would be seasonal variations, or valleys with orientations other than E-W.

Good responses will deal with the pros and cons of each resource, have a sound grasp of microclimates in the context of valleys and probably acknowledge other resources which could be useful (e.g synoptic charts)

L3 (6-8 marks)

Clear and detailed analysis of the usefulness and limitations of the resources. A sound grasp of microclimate. The resources are well used to support the points made. A clear understanding of other resources which would be of use.

L2 (3-5 marks)

Some analysis of the usefulness and limitations of the resources, which may be unbalanced.

Provides support for some observations.

At the top end there may be a limited awareness of other resources which might be useful.

L1 (0-2 marks)

Little understanding of the usefulness of the resources; perhaps simple description.

Support is inaccurate or lacking.

[8]

2 Study Fig. 4 which shows temperatures for the town of Chapel Hill, North Carolina, USA on the night of 15th September 1969.

(a) Using Fig. 4, to what extent does Chapel Hill appear to display a heat island effect?

It's possible to argue to some extent, to a great extent, or that it doesn't.

Whichever argument is chosen, look to the quality of support from the diagram to judge the quality of the response. Don't credit explanation.

A number of valid points could be made:

- The areas of highest population density have the highest temperatures (above 21 °C), supporting the UHI effect
- To the South there appears to be a classic UHI effect – temperatures rising from below 17°C to above 21 °C in the area of highest population density
- To the North and East the pattern is not so clear – the intensity of the effect is much reduced (from about 19 °C to 21 °C) and the gradient is much gentler

L3 (4-5 marks)

Clear and detailed analysis of the extent to which Chapel Hill displays an UHI. Data is well used to support the points made.

L2 (2-3 marks)

A valid attempt to assess the extent to which Chapel Hill displays an UHI Data is used to support the points.

L1 (0-1 marks)

Limited ability to interpret the resource, may simply describe. Use of data is inaccurate or lacking

[5]

(b) From your wider study of microclimates, under what conditions, and for what reasons, are urban heat islands most likely to form?

A fairly straightforward response is required here, addressing both aspects of the question and displaying good understanding of the interplay between conditions and processes for good marks.

L3 (8-10 marks)

Both aspects of the question are discussed and are to the fore, though a balance is not required for full marks. The answer also addresses the judgement requested by 'most likely to form'.

L2 (5-7 marks)

An understanding of the conditions and reasons supported by material from more than one example. A fairly standard approach without displaying an understanding of the interplay between conditions and processes.

L1 (0-4 marks)

There is some reference to UHIs the approach is largely descriptive. The exemplar support may be missing or, if present, lacks detail

[10]

3 With reference to your own investigation of deprivation, discuss the strengths and limitations of the use of primary sources and secondary sources of information.

Begin by stating the question or hypothesis that you investigated. [15]

Candidates should base their responses firmly in the results of their own investigation and quote evidence from that investigation to establish clearly the strengths and limitations of the primary and secondary sources used. Strengths of primary sources are likely to focus upon issues of reliability, which could be related to sampling techniques and sizes, accuracy of any equipment used and diligence in the collection process. Strengths of secondary sources are likely to focus on the reliability of published material. Limitations of primary sources are likely to focus on the difficulties involved in the data collection process, while limitations of secondary sources might consider how up-to-date the material is and the scale at which the material is available. Candidates should consider both strengths and weaknesses of both sources of information and provide some assessment of these strengths and weaknesses.

Possible strengths could include:

- a carefully and logically structured sampling framework with a good sample size that covered the area(s) chosen for study fully;
- the use of repeated readings to increase accuracy;
- the reliability of any equipment used and the diligence with which it was operated;
- the reliability of secondary sources used, which might include base maps at different scales, geology maps, hydrological and precipitation data from official sources.

Possible limitations could include:

- practical considerations, such as weather conditions, time limitations, accessibility and minimising risk;
- problems experienced with the equipment used;
- how up-to-date the secondary sources were;
- the scale at which secondary data were available.

L4 (13–15 marks)

Candidates cover a range of possible strengths and weaknesses of both primary and secondary sources. Discussions are detailed and show a clear understanding of the nature of the strengths and weaknesses identified. An assessment of the importance of these strengths and weaknesses is clear. The whole answer is clearly built around the candidate's own investigation.

L3 (10–12 marks)

Candidates cover a range of possible strengths and weaknesses of both primary and secondary sources. Discussions are detailed and show an understanding of the nature of the strengths and weaknesses identified, but may show an imbalance between primary and secondary sources or between strengths and weaknesses. An assessment of the importance of these strengths and weaknesses is present. The answer makes appropriate reference to the candidate's own investigation.

L2 (7–9 marks)

Candidates cover a narrow range of possible strengths and weaknesses of both primary and secondary sources. Discussions are sound and show some understanding of the nature of the strengths and weaknesses identified, but show an imbalance between primary and secondary sources or between strengths and weaknesses. An assessment of the importance of these strengths and weaknesses is present, but lacks any development. The answer makes appropriate reference to the candidate's own investigation, but some points made are rather generalised.

L1 (0–6 marks)

Candidates cover a narrow range of possible strengths and weaknesses and may concentrate on either primary or secondary sources. Discussions lack detail but show some understanding

of the nature of the strengths and weaknesses identified. An assessment of the importance of these strengths and weaknesses is likely to be absent. The answer makes little appropriate reference to the candidate's own investigation, but some points made are rather generalised.

4 In your own investigation of deprivation, to what extent could the variations you found be explained?

Begin by stating the question or hypothesis that you investigated. [15]

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